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Orthodontic treatment-related caregiver burden and coping strategies: a cross-sectional study

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Abstract

Background: Caregivers of patients undergoing orthodontic treatment are at risk of experiencing caregiver burden. This burden can Constitute barrier to optimal care. Objectives: This study evaluated level of caregiver burden, coping strategies and other associated factors in group of caregivers of patients receiving orthodontic treatment. Methodology: A descriptive cross-sectional study conducted among consecutive consenting adult caregiver–patient pairs that presented at the orthodontic clinic of a tertiary hospital in south-west Nigeria between January-December 2021.

Demographic data and the level of caregiver's burden were assessed using semi-structured interviewer administered questionnaire and the Zarit burden interview score respectively. Data obtained were entered into SPSS version 20; analyzed using descriptive and inferential statistics.

Results: total of 112 caregivers were included in the study comprising fathers (55.4%), mothers (30.4%), sister (2.7%); other relatives (11.6%) with mean age of 44.8 (SD, 11.7) years (range 14-68 years). The level of caregiving burden was reported as little to no burden (69.6%), mild to moderate (23.2%), moderate to severe (3.6%) and severe (3.6%). Majority reported some caregiver needs such as money (46.4%) and transport (21.4%). Coping strategies include family support (35.7%), self-encouragement (30.4%), reinforcement and incentives (16.1%). The significant and independent predictors of high caregiver burden were prolonged caregiving time (OR=6.55, 95%CI=2.10-20.4, p=0.001) and poor family support (OR=3.32, 95%CI=1.29-8.59, p=0.013). Conclusions: In order to ensure optimal care, reduction of caregiver burden requires need for a care plan that addresses the caregivers' needs. Orthodontists and dental professionals should adequately educate caregivers on effective coping strategies.

Keywords: caregivers, burden, orthodontic treatment

Introduction

Caregiver burden refers to the emotional, physical, financial burdens that family

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caregivers experience resulting from the illness of a relative while giving unpaid informal care to the sick relative.[1, 2] Caregivers provide physical assistance by helping with daily activities, running errands, etc. while also providing emotional support and company to the care receiver. Caregiving can be full-time or part-time, and formal or informal whereby the caregiver provides caregiving services without financial compensation.[1] While caregiving is generally beneficial to the receiver, it is however associated with some physical, emotional and psychological burden on the well-being of the caregiver, regardless of mode of caregiving.[3]

The caregiver literature has explored this burden mainly in the hospitalized patients as it pertains to caring for patients with chronic disease conditions such as mental illness [4-6], renal diseases[7,8], people living with HIV/AIDS (PLWHA)[9], cancer[10-11], cardiac disease[12-13] and those undergoing surgical treatment.[14-15]

There is however little or no previous documentation in scientific literature of caregiver burden in patient receiving orthodontic treatment. Orthodontic treatments frequently entail increased demand for brushing and oral hygiene practices, dietary restrictions and other instructions that the patient must obey in the course of treatment. Majority of orthodontic treatments are initiated in children who may not be able to cope with the increased demand for brushing and oral hygiene practices.[16] Subsequently, parents and caregivers of such patients often bear some responsibilities to ensure the success of their children's treatment.[17]

In addition, Orthodontic therapy is typically of relatively long duration involving multiple visits and appointments which parents and guardians must comply with, potentially adding another layer to their burden.[18-20]

Given the fact that caregiver burden is an obstacle to dental care [21], this gap in research needs to be addressed, hence the need for this study. Therefore, this study determined the level of burden of family caregivers of orthodontic patients, their needs and coping strategies as well as associated factors.

Materials and methods

Study site and study design

This descriptive cross-sectional study was conducted from January to December 2021 at the orthodontic clinic of the dental centre, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria.

Study population

The study population were adult family caregivers aged 18 years and above and their relatives that received orthodontic treatment at the study site during this period.

Inclusion criteria

These included family caregivers and their patients who consented to participating in the study.

Exclusion criteria

These were family caregivers that were not available or whose relatives were too ill to participate in this study.

Sample size calculation

The sample size of 110 was calculated using the formula for descriptive health studies ($n=Z^2pq/d^2$) where 7% of family caregivers had severe burden with non-responders considered.[22]

Data Collection

Data collection was done with a semi-structured interviewer administered questionnaire that assessed the patient's age, sex, diagnosis, level of education, duration of hospital admission, and treatment given. Also, information on the family caregivers' age, sex, family setting, relationship to patient, number of children, care-giving time, caregivers' need, and coping strategies during caregiving were collected. Furthermore, information on the amount of money per month made by the caregivers and their relatives were collected and then classified with those earning less than the Nigerian minimum wage of 30,000 Naira defined as low income earners. The level of caregiver's burden was assessed using the Zarit burden index which has been widely utilized locally and internationally as a legitimate and reliable instrument for assessing caregiver's burden.[22-26] The 22-item burden index has values that range 0 - 88, with the value increase in direct proportion to how severe the caregiver perceives the burden. It is classified as no or little burden 0 - 20, mild to moderate burden 21 - 40, moderate to severe burden 41 - 60, and severe burden 61 - 88. Also, value 0 - 20 is taken as low burden and greater than 20 as high burden. It uniquely measures health, psychological well-being, finances, social life of caregivers, and their relationship with the patient. This scale has 0.91 internal consistency and 0.71 test–retest reliability.[1]

Data Analysis

Data analysis was done using the Statistical Package for Social Sciences (SPSS 20.0) to present descriptive statistics such as mean, SD, proportions and frequencies. Inferential statistics used include Chi-square test of associations between caregiver characteristics and burden while further evaluation were done with logistic regression analysis.

Odds ratio (OR) and 95% CI with a p-value of < 0.05 were considered statistically significant. Analyses done were presented in tables and diagrams.

Ethical considerations

The respondents were assured of the confidentiality of the information obtained after which they completed an informed consent. An institutional ethical clearance certificate (protocol number IPH/OAU/12/1245) was obtained.

Results

One hundred and twelve caregiver-patient pairs were included in this study. The patients' mean age (SD) was 19.5 (8.2) years (range 2-59 years).

Table I depicts the socio-demographic variables, diagnosis, hospital admission status and method of treatment of the patients. Majority of the patients were females (65.2%), older than 10 years (93.7%), had tertiary education (58.9%), monogamous family setting (92.9%), financially constrained (46.4%), with the majority being diagnosed with Angles Class

II division I mal-occlusion (56.3%) on fixed appliance therapy (97.3%) and were not admitted (100%).

The mean age of the family caregivers was 44.8 (SD, 11.7) years (Range 14-68). They were mostly fathers (55.4%), traders (42%), Christians (88.4%), had tertiary education (87.5%) and earned more than the minimum wage (75.9%) (Table 2).

Table 3 shows the level of care-giving burden, needs and coping strategies of the family caregivers. The majority reported their level of care-giving burden as little to no burden (69.6%) with only 3.6% reporting severe burden. Also, most caregivers cared for their relatives less than 8 hours daily (55.4%). Interestingly, despite these findings, majority reported some caregiver needs such as money (46.4%) and transport (21.4%) while the remaining 29.5% did not report any need. These caregivers get tired (19.6%) while some (11.6%) reported late to work because of their role as caregivers. Coping strategies include family support (35.7%), self-encouragement (30.4%), reinforcement and incentives (16.1%).

Table 4 reports the factors associated with burden of family caregivers of orthodontic patients. High proportion of caregivers who were less than 30 years (32.1% vs. 29.8%; p=0.812), had tertiary education (32.7% vs. 14.3%; p=0.221), earned above minimum wage (30.6% vs. 29.6%; p=0.925) were associated with high caregiver burden. The only statistically significant factor associated with high caregiver burden was poor family support (52.2% vs. 24.7%; p=0.011).

Also, patient's income and gender had no statistical significant association with caregiver burden. The statistically significant and independent predictors of high caregiver burden were prolonged care-giving time (OR=6.55, 95%CI=2.10-20.4, p=0.001) and poor family support (OR=3.32, 95%CI=1.29-8.59, p=0.013) (Table 4).

Table 1: Socio-demographic variables, diagnosis, hospital admission status and method of treatment of Orthodontic patients (n=112)

Variable	Frequency	%
Age Group		
<10 years	7	6.3
>10 years	105	93.7
Gender		
Male	39	34.8
Female	73	65.2
Level of education		
None	1	0.9
Primary	4	3.6
Secondary	41	36.6
Tertiary	66	58.9
Family setting		
Monogamous	104	92.9
Polygamous	8	7.1
Diagnosis		
Angles class 1	17	15.2
Angles class II div 1	63	56.3
Angles class II div 2	2	1.8
Angles class III	23	20.5
Bimaxillary proclination	4	3.6
Anterior openbite	3	2.7
Type of orthodontic treatment		
Fixed appliances	109	97.3
Removable appliances	2	1.8
Functional appliances	1	0.9
Hospital admission		
Out-patient	112	100

The mean age of the family caregivers was 44.8 (SD, 11.7) years (Range 14-68). They were mostly fathers (55.4%), traders (42%), Christians (88.4%), had tertiary education (87.5%) and earned more than the minimum wage (75.9%) (Table 2).

Table 2: Socio-demographic characteristics of family caregivers of Orthodontic Patients

Variable	frequency	%
Family Caregiver		
Father	62	55.4
Mother	34	30.4
Sister	3	2.7
*Others	13	11.6
Gender of primary the caregiver		
Male	53	47.3
Female	59	52.7
Level of education of the primary caregiver		
None	6	5.4
Primary	2	1.8
Secondary	6	5.4
Tertiary	98	87.5
Occupation of the primary caregiver		
Teacher	18	16.1
Civil Servant	32	28.6
Trader	47	42.0
Doctor	12	10.7
Freelance Worker	3	2.7
Religion of the primary caregiver		
Christianity	99	88.4
Islam	8	7.1
Traditional	5	4.5
Monthly income (Naira) of the primary caregiver		
<30000($60)	27	24.1
>30000($60)	85	75.9

*Grandparents, Uncle, Aunt, Brother

Table 3 shows the level of care-giving burden, needs and coping strategies of the family caregivers. The majority reported their level of care-giving burden as little to no burden (69.6%) with only 3.6% reporting severe burden. Also, most caregivers cared for their relatives less than 8 hours daily (55.4%). Interestingly, despite these findings, majority reported some caregiver needs such as money (46.4%) and transport (21.4%) while the remaining 29.5% did not report any need. These caregivers get tired (19.6%) while some (11.6%) reported late to work because of their role as caregivers. Coping strategies include family support (35.7%), self-encouragement (30.4%), reinforcement and incentives (16.1%).

Table 3: Caregiving burdens, needs and coping strategies of primary caregivers of Orthodontic patients (n =112).

Variables	Frequency	%
Caregiver burden		
Severe	4	3.6
Moderate to severe	4	3.6
Mild to moderate	26	23.2
Little to no burden	78	69.6
Caregiver's time (hours/day)		
Less than 8	62	55.4
8-<24	32	28.6
24	18	16.0
Caregiver need		
None	33	29.5
Money/Financial support	52	46.4
Transport	24	21.4
Clothing	1	0.9
Accommodation	2	1.8
Effect of caregiving		
Gets tired	22	19.6
Absence from work	13	11.6
None	77	68.8
Coping strategy		
Casual leave	6	5.4
Prayer	10	8.9
Family support	40	35.7
Had to work harder	4	3.6
Self-encouragement	34	30.4
Reinforcement and incentives	18	16.1

Table 4 reports the factors associated with burden of family caregivers of orthodontic patients. High proportion of caregivers who were less than 30 years (32.1% vs. 29.8%; p=0.812), had tertiary education (32.7% vs. 14.3%; p=0.221), earned above minimum wage (30.6% vs. 29.6%; p=0.925) were associated with high caregiver burden. The only statistically significant factor associated with high caregiver burden was poor family support (52.2% vs. 24.7%; p=0.011).

Also, patient's income and gender had no statistically significant association with caregiver burden. The statistically significant and independent predictors of high caregiver burden were prolonged care-giving time (OR=6.55, 95%CI=2.10-20.4, p=0.001) and poor family support (OR=3.32, 95%CI=1.29-8.59, p=0.013) (Table 4).

Table 4: Logistic regression analysis of Factors Associated with Caregiver among caregivers of Orthodontic Patients

Variable	Caregiver Burden		Test statistics	OR, 95% CI, p-value
	Low (%)	High (%)		
Caregiver's age (years)				
<30	19 (67.9)	9 (32.1)	0.056; 0.812	1.12; 0.45-2.81, 0.812
≥30 (Ref.)	59 (70.2)	25 (29.8)		1
Caregiver's education				
≤ Secondary (Ref.)	12 (85.7)	2 (14.3)	1.955; 0.221	1
Tertiary	66 (67.3)	32 (32.7)		0.34, 0.07-1.63, 0.178
Caregiver's income (Naira)				
<30000 (Ref.)	19 (70.4)	8 (29.6)	0.009; 0.925	1
≥30000	59 (69.4)	26 (30.6)		0.96, 0.37-2.46, 0.925
Patient's income (Naira)				
<30000	51 (68)	24 (32)	0.290; 0.590	1.27, 0.53-3.04, 0.591
≥30000 (Ref.)	27 (73)	10 (27)		1
Patient's gender				
Male	23 (59)	16 (41)	3.221; 0.073	0.47, 0.21-1.08, 0.075
Female (Ref.)	55 (75.3)	18 (24.7)		1
Caregiving time (hours/day)				
<8 (Ref.)	50 (80.6)	12 (19.4)	11.847; 0.003	1
8-<24	21 (65.6)	11 (34.4)		2.18, 0.83-5.72, 0.113
24	7 (38.9)	11 (61.1)		6.55, 2.10-20.4, 0.001
Family support				
Poor	11 (47.8)	12 (52.2)	6.516; 0.011	3.32, 1.29-8.59, 0.013
Good (Ref.)	67 (75.3)	22 (24.7)		1

Ref. Reference category

Discussion

The present study assessed the burden of the caregivers of patients receiving orthodontic treatment in a non-hospitalized setting. It reported the caregiver's burden among caregivers of most patients as little or no burden. This magnitude of caregiver's burden varies in previous studies with Gbolahan et al.[23] (2020) reporting 40% in a study among orofacial cleft patients, and Olowookere et al.[22] in another study among ophthalmic patients reporting 18.4%. The higher proportion of little or no burden reported in this study could be partly because none of the orthodontic patients studied were hospitalized. Several studies have reported higher caregiver's burden when patient's treatment requires hospital admission.[15, 24, 26]

More females received orthodontic treatment in the present study. This has been earlier reported and is attributed to the fact that females are more concerned about facial aesthetic than males.[27] More than one-half of the patients were diagnosed with Angles Class II division I malocclusion. Indeed, this malocclusion trait has been earlier documented as the second commonest in our environment.[27-28]

In this study, more fathers were caregivers, which could have resulted from the fact that the patients studied were adolescents and adults. This is a significant deviation from the finding in a previous study which reported that about two-third of the caregivers of patients attending the orthodontic clinic were mothers.[17]

It is noteworthy that money was the major need of the caregivers. Orthodontic therapy is relatively expensive when compared to other dental care services and is not usually covered under the health insurance scheme. [21] Other needs such as transport and accommodation were reported in this study. Several studies on caregiver's burden in this environment have reported similar findings.[22,24]

Coping strategies relating to care-giving burden reported in this study include family support, self-encouragement, reinforcement and incentives. Previous studies have reported these coping strategies among family caregivers.[8, 22, 23] There is therefore a need for orthodontists and other dental professionals to adequately educate the family caregivers on effective coping strategies.

This study reported that the factors associated with high burden among family caregivers of orthodontic patients included age less than 30 years, having tertiary education, earning above minimum wage but without statistical association. However, care-giving time and poor family support were found to be statistically significant and predict high caregiver's burden among caregivers of orthodontic patients. Various studies on caregiver's burden have reported varying factors depending on the characteristics of their study population. For instance, care-giving time increased burden among cancer patients while income predicted high burden among dialysis patients. Also, higher level of education was associated with low caregiver burden.[29] Hence, the finding that income of the patients and caregivers had no effect on their caregiver's burden requires further study.

Study limitation

This study is limited by being self-reported with cross-sectional design conducted in an orthodontic clinic. However, it is the first study that assessed caregiver burden among family caregivers of orthodontic patients as far as the authors know; hence, it contains information that will make the orthodontic clinic more patient-friendly. Also, in order to reduce any bias, the researchers explain the purpose of the study to the respondents during the process of taking informed consent.

Conclusion

Family caregivers of orthodontic patients have low to no caregiver's burden. Prolonged care-giving time and poor family support predict high caregiver's burden among these caregivers. Money was the major caregiver's need while coping strategies relating to caregiver's burden include family support, self-encouragement, reinforcement and incentives. In order to ensure orthodontic patients have optimal care, it is necessary to reduce caregiver's burden to the barest minimum, hence the need for a care plan that will address the needs of these caregivers. There is therefore a need for orthodontists and other dental professionals to adequately educate the parents/guardians on effective coping strategies.

Reference

1. Zarit SH, Reever KE, Bach-Peterson J. Relatives of the impaired elderly: correlates of feelings of burden. Gerontologist. 1980;20(6):649-55.

2. Zarit SH, Todd PA, Zarit JM. Subjective burden of husbands and wives as caregivers: a longitudinal study. Gerontologist. 1986;26(3):260-6.

3. Ozkan Tuncay F, Kars Fertelli T. Effects of the caregiver burden perceived by caregivers of patients with neurological disorders on caregiver wellbeing and caregiver stress. Perspect Psychiatr Care. 2019;55(4):697-702.

4. Kayaalp A, Page KJ, Rospenda KM. Caregiver Burden, Work-Family Conflict, Family-Work Conflict, and Mental Health of Caregivers: A Mediational Longitudinal Study. Work Stress. 2021;35(3):217-40.

5. Mulud ZA, McCarthy G. Caregiver Burden Among Caregivers of Individuals With Severe Mental Illness: Testing the Moderation and Mediation Models of Resilience. Arch Psychiatr Nurs. 2017;31(1):24-30.

6. Sharif L, Basri S, Alsahafi F, Altaylouni M, Albugumi S, Banakhar M, et al. An Exploration of Family Caregiver Experiences of Burden and Coping While Caring for People with Mental Disorders in Saudi Arabia-A Qualitative Study. Int J Environ Res Public Health. 2020;17(17).

7. Rentz AM, Skalicky AM, Liu Z, Dunn DW, Frost MD, Nakagawa JA, et al. Burden of renal angiomyolipomas associated with tuberous sclerosis complex: results of a patient and caregiver survey. J Patient Rep Outcomes. 2018;2:30.

8. Avsar U, Avsar UZ, Cansever Z, Yucel A, Cankaya E, Certez H, et al. Caregiver Burden, Anxiety, Depression, and Sleep Quality Differences in Caregivers of Hemodialysis

Patients Compared With Renal Transplant Patients. Transplant Proc. 2015;47(5):1388-91.

9. Chandran V, Madi D, Chowta N, Ramapuram J, Bhaskaran U, Achappa B, et al. Caregiver Burden among Adults Caring for People Living with HIV/AIDS (PLWHA) in Southern India. J Clin Diagn Res. 2016;10(5):OC41-3.

10. Kristanti MS, Vernooij-Dassen M, Utarini A, Effendy C, Engels Y. Measuring the Burden on Family Caregivers of People With Cancer: Cross-cultural Translation and Psychometric Testing of the Caregiver Reaction Assessment-Indonesian Version. Cancer Nurs. 2021;44(1):37-44.

11. La IS, Johantgen M, Storr CL, Zhu S, Cagle JG, Ross A. Caregiver burden and related factors during active cancer treatment: A latent growth curve analysis. Eur J Oncol Nurs. 2021;52:101962.

12. Dirikkan F, Baysan Arabaci L, Mutlu E. The caregiver burden and the psychosocial adjustment of caregivers of cardiac failure patients. Turk Kardiyol Dern Ars. 2018;46(8):692-701.

13. Bohm M, Cronberg T, Arestedt K, Friberg H, Hassager C, Kjaergaard J, et al. Caregiver burden and health-related quality of life amongst caregivers of out-of-hospital cardiac arrest survivors. Resuscitation. 2021;167:118-27.

14. Guner Y, Cilingir D. Evaluation of Caregiver Burden of Family Members Providing Support for the Care of Patients Undergoing Brain Surgery at the Hospital. Florence Nightingale J Nurs. 2021;29(2):167-75.

15. Ariza-Vega P, Ortiz-Pina M, Kristensen MT, Castellote-Caballero Y, Jimenez-Moleon JJ. High perceived caregiver burden for relatives of patients following hip fracture surgery. Disabil Rehabil. 2019;41(3):311-8.

16. Abreu LG, Corradi-Dias L, Dos Santos TR, Melgaço CA, Lages EMB, Paiva SM. Quality of life of families of adolescents undergoing fixed orthodontic appliance therapy: Evaluation of a cohort of parents/guardians of treated and untreated individuals. Int J Paediatr Dent. 2020;30(5):634-41.

17. Ernest MA, daCosta OO, Adegbite K, Yemitan T, Adeniran A. Orthodontic treatment motivation and cooperation: A cross-sectional analysis of adolescent patients' and parents' responses. J Orthod Sci. 2019;8:12.

18. Hameed O, Amin N, Haria P, Patel B, Hay N. Orthodontic burden of care for patients with a cleft lip and/or palate. J Orthod. 2019;46(1):63-7.

19. Roguzińska S, Pelc A, Mikulewicz M. Orthodontic-care burden for patients with unilateral and bilateral cleft lip and palate. Dent Med Probl. 2020;57(4):411-6.

20. Matsuda Y, Izumi M, Nakamichi A, Isobe A, Akifusa S. Validity and reliability of the oral health-related caregiver burden index. Gerodontology. 2017;34(3):390-7.

21. Chi DL, McManus BM, Carle AC. Caregiver burden and preventive dental care use for US children with special health care needs: a stratified analysis based on functional

limitation. Matern Child Health J. 2014;18(4):882-90.

22. Olowookere SA, Badmus SA, Laoye O, Ijadunola MY, Hassan M. Burden of family caregivers of ophthalmic patients in a university teaching hospital in south-west Nigeria. Malawi Med J. 2019;31(1):39-44.

23. Gbolahan. <The Burden and Perceived Stress on Family Caregivers of Patients With Orofacial Cleft Deformities in The Perioperative Period of Cleft Repair.pdf>.

24. Olawale KO, Mosaku KS, Fatoye O, Mapayi BM, Oginni OA. Caregiver burden in families of patients with depression attending Obafemi Awolowo University teaching hospitals complex Ile-Ife Nigeria. Gen Hosp Psychiatry. 2014;36(6):743-7.

25. Yu Y, Liu ZW, Li TX, Zhou W, Xi SJ, Xiao SY, et al. A comparison of psychometric properties of two common measures of caregiving burden: the family burden interview schedule (FBIS-24) and the Zarit caregiver burden interview (ZBI-22). Health Qual Life Outcomes. 2020;18(1):94.

26. Akpan-Idiok PA, Anarado AN. Perceptions of burden of caregiving by informal caregivers of cancer patients attending University of Calabar Teaching Hospital, Calabar, Nigeria. Pan Afr Med J. 2014;18:159.

27. Kolawole KA, Otuyemi OD, Jeboda SO, Umweni AA. Awareness of malocclusion and desire for orthodontic treatment in 11 to 14 year-old Nigerian schoolchildren and their parents. Aust Orthod J. 2008;24(1):21-5.

28. Dacosta OO. The prevalence of malocclusion among a population of northern Nigeria school children. West Afr J Med. 1999;18(2):91-6.

29. Mashayekhi F, Pilevarzadeh M, Rafati F. The Assessment of Caregiver Burden in Caregivers of Hemodialysis Patients. Mater Sociomed. 2015;27(5):333-6.